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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/144,920	09/01/98	GRIFFIN	4990.21

001321
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EXAMINER

NGUYEN, T

ART UNIT PAPER NUMBER

2877

DATE MAILED: 09/14/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/144,920

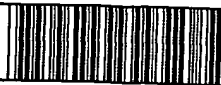
Applicant(s)

Griffin

Examiner

Nguyen, Tu T.

Group Art Unit
2877



- ☐ Responsive to communication(s) filed on _____
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1-34 is/are pending in the application.
- Of the above, claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-34 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claims _____ are subject to restriction or election requirement.

Application Papers

- ☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- *Certified copies not received: _____
- ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☒ Notice of References Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 2
- ☐ Interview Summary, PTO-413
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---



UNITED STATES DEPARTMENT OF COMMERCE
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Paper No. 3

Serial Number: 09/144,920

Filing Date: 09/01/98

Detailed Office Action

Drawings

Figures 1-2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 22 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 22, line 12, it is not clear which "the light input end" and "the light output end" are referred to (the illumination fiber or the collection fiber). Both fibers have a light input end

and a light output end. How can the light input end be located adjacently with the light output end? For the purpose of examination, Examiner make an assumption that the claimed collection fiber is a fiber which collects the light coming out from the first taper.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7,13-14,18,21-22,24-25,30 are rejected under 35 U.S.C. 102(b) as being anticipated by Journal Of Lightwave Technology (JOLT) in January 1987 or JOLT in August 1987 or Prince (5,133,709) or Kondoh et al. (5,058,978).

JOLT in January discloses a tapered fiber section (fig 1a or 1b) comprising a light input end of a first diameter (fig 1b, A) and having a light output end of a second diameter greater than said first diameter. The taper section has a generally conical shape.

JOLT in August discloses a tapered fiber section (fig 6) comprising a light input end of a first diameter (fig 6, taper) and having a light output end of a second diameter greater than said first diameter. The taper section has a generally conical shape.

Prince discloses a tapered fiber section (fig 1) comprising a light input end of a first diameter (fig 1,3) and having a light output end of a second diameter (fig 1, 4) greater than said first diameter. The taper section has a generally conical shape.

Kondoh discloses a tapered fiber section (fig 5) comprising a light input end of a first diameter (fig 5,2A) and having a light output end of a second diameter (fig 5, 2C) greater than said first diameter. The taper section has a generally conical shape.

With respect to claim 13, Prince or Kondoh discloses a uniform taper angle (Prince, fig 4) and (Kondoh, fig 3).

With respect to claims 21,25,30, the claimed glass fibers are inherent.

With respect to claim 22, based on the assumption from above, JOLT in January discloses an optical assembly comprising (please see the attachment A): an illumination fiber (fig 9, 1), a first taper fiber section (fig 9,2), a collection fiber (fig 9,4).

With respect to claim 24, the collection fiber section comprising: a second tapered fiber section (fig 9, 3) and the light output end has a smaller diameter than the light input end.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371⁶ of this title before the invention thereof by the applicant for patent.

Claims 1-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Nightingale (5,852,692).

Nightingale discloses a second fiber (abstract) which has a tapered fiber section (fig 7) comprising a light input end of a first diameter (fig 7,29) and having a light output end of a

second diameter (fig 7, 38) greater than said first diameter. The taper section has a generally conical shape.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-12,15-17,19-20,23,26-29,31-34, are rejected under 35 U.S.C. 103(a) as being unpatentable over JOLT in January or Nightingale (5,852,692).

With respect to claims 8-9,15,19,23,29,32-34, JOLT or Nightingale disclose the claimed invention except for not clearly disclose the type of connection as claimed. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the prior art system with different types of connection, since the connection type is not the scope of the invention so the modification would involve only routine skill in the art.

With respect to claim 10,16, the glass fibers would have been obvious.

With respect to claim 11, JOLT or Nightingale disclose the claimed invention except for the claimed ratio (3:1). It would have been obvious to one having ordinary skill in the art at the time of the invention was made modify the input and output diameter with a different ratio, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

With respect to claims 12,20, JOLT discloses the claimed invention except for a collimating lens on the output end of the taper section. JOLT discloses the lens on the input end (fig 4). It would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the position of the lens to make the system output more accurate.

With respect to claim 17, The taper fiber section has a generally conical shape.

With respect to claims 26-27,31, JOLT in January discloses the claimed invention except for the plurality of identical collection fiber section. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the system in JOLT with a plurality of collection fibers, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

With respect to claim 28, fig 9 in JOLT (please see attachment A) discloses the output of the first tapered fiber (fig 9, 2) and the input end (fig 9, 3) of the collection fiber are coupled to one another.

Papers related to this application may be submitted to TC 2877 by facsimile transmission. Papers should be faxed to TC 2877 via the PTO Fax Center located in CP4-4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Center number is (703)308-7722.

If the Applicant wishes to send a Fax dealing with either a Proposed Amendment or for discussion for a phone interview then the fax should:

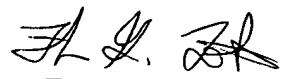
- a) Contain either the statement "DRAFT" or "PROPOSED AMENDMENT" on the Fax Cover Sheet; and
- b) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

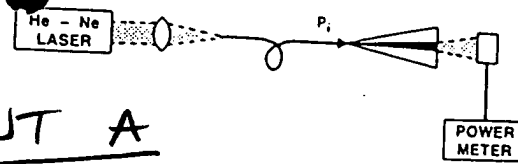
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu Tuan Nguyen whose telephone number is (703) 306-9185.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

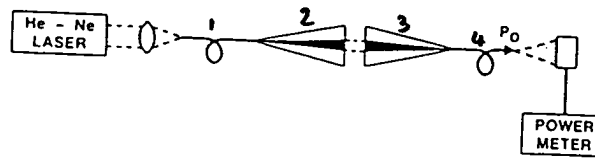
Tu Tuan Nguyen
Patent Examiner
TC 2877
September 10, 2000/TTN


Frank G. Font
Supervisory Primary Examiner
Group Art Unit 2877

ATTACHMENT A



(a)



(b)

Fig. 9. Experimental procedure for measuring the insertion loss of an optical fiber taper. (a) Establishing the power level reference, (b) Measurement of insertion loss.

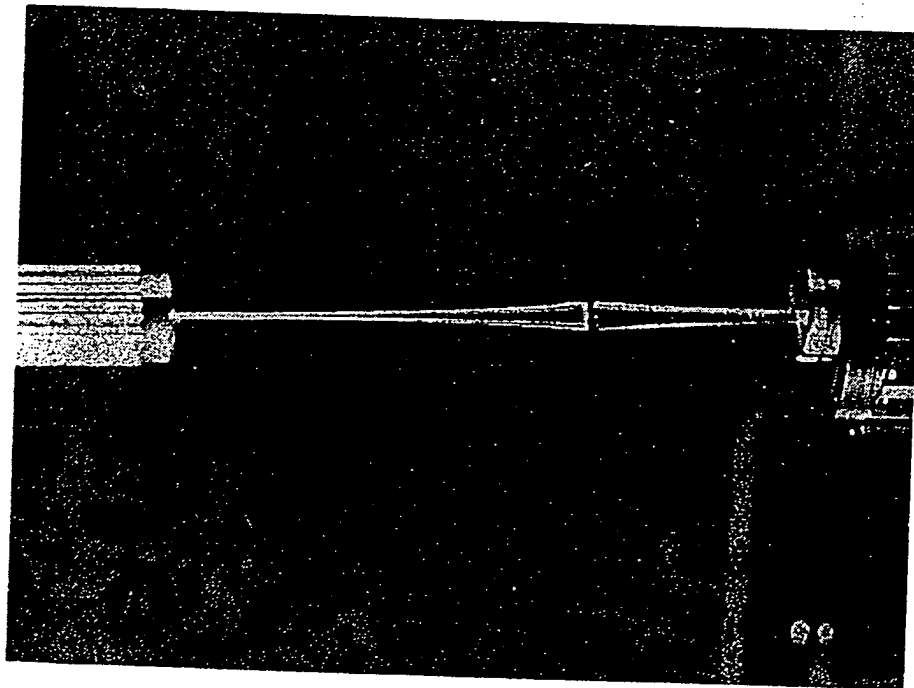


Fig. 10. Experimental mounting of two optical fiber tapers.

an axial displacement of $16.5 \mu\text{m}$ for fiber coupling and $91 \mu\text{m}$ for taper coupling. The price one pays for this increase in translational sensitivity is an increase in angular sensitivity of the taper coupling relative to the fiber coupling, by a factor equal to the decrease in lateral sensitivity. This is shown in Fig. 8(c) where, again, the fiber represented by the solid curve and the taper by the dashed one. The 0.5-dB loss point corresponds to an angular displacement of 1.77° for fiber coupling and 0.42° for taper coupling. Angular accuracies well below 0.42° can be easily achieved in practice.

Excess Coupling Loss—Measurements

The experimental procedure is depicted in Fig. 9. Power launched into the fiber pigtail. The cladding modes are stripped and we measure the transmitted power which is carried by the dominant mode, Fig. 9(a). This measurement, with index matching, establishes the power refer-

ence level P_i . We now add the second taper and properly position and align both tapers. The tapers are held on electronically adjustable micropositioning stages. We index match the space between the tapers and measure the power transmitted from the fiber pigtail of the second taper P_o in Fig. 9(b). The ratio P_o/P_i is the excess coupling loss which was previously discussed. These experimental points are plotted by the circles in Fig. 8.

Fig. 10 shows the actual mounted tapers used in the experiment. Examining Fig. 8, we note the excellent agreement between the experimental and analytical results for the lateral and axial displacements. The results of two series of measurements are displayed in Fig. 8(c) for the angular displacement, showing good agreement. The angular and transverse measurements were made with the tapers close together.

The taper length and profile used in this work are not critical for preserving the guidance of the fundamental